UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Application Number: 09/977,875
Filing Date: October 15, 2001
Appellant(s): ECKHOFF ET AL.

William D. Davis (38428)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 11-16-2007 appealing from the Office action mailed

10-18-2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings

which will directly affect or be directly affected by or have a bearing on the Board's decision in

the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in

the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the.grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US patents to Apfel (5,619,567), Ludeman (6,665,398), Ortel (6,157,716) and Zhou

(5878133)

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

2. **Claims 1,2,13,** rejected under 35 U.S.C. 103(a) as being unpatentable over Apfel

(5619567) and further in view of Ludeman (6665398).

As per **claim 1,** Apfel discloses a variable DC feed characteristic for a SLIC that

switches from a normal mode 401 to a modified mode 402 DC feed (Fig. 4). The normal

mode is switched to the modified mode when Vab is less than or equal to threshold B.

The mode is switched back to the normal mode at threshold E. Apfel discloses that mode

is switched (from either on-hook to off-hook or off-hook to on-hook) based upon a hook

switch threshold (points E and B in Fig. 4). However, Apfel does not disclose that the

switching occurs occurs at two distinct loop currents (Apfel only has one switching

threshold).

Ludeman discloses a SLIC that provides a 'threshold window' 100 (Fig. 4) that

comprises two distinct switching points Ish- and Ish+ to begin the switching from onhook

to offhook and from offhook to onhook. The points are set based upon a programmable

threshold value (Col 5 lines 10-30). Ludeman discloses that prior art systems such as that

shown in Fig. 2 rely on single switching thresholds are unstable around the transition

point because of the speed of change (Col 2 lines 10-25), and teaches that his inventive

system overcomes the drawbacks of the prior art (Col 2 lines 50-55). It would have been

obvious to one of ordinary skill in the art at the time of this application to have two

distinct switching points B and E in Fig. 4 of Apfel for the purpose of providing a longer,

and more stable transition.

As per **claim 13,** it is rejected for the same reasons as the claim 1 rejection.

As per **claim 2,** curve 401 (APFEL: Fig. 4) is linear, defined by VBAT-Voff1,

and has a slope corresponding to an impedance.

3.   **Claims 3-5,14,16** rejected under 35 U.S.C. 103(a) as being unpatentable over Apfel

(5619567) in view of Ludeman (6665398) as applied to claims 1,13.

As per **claims 3,14,16,** Apfel uses an open circuit voltage value (VBAT-Voff1), two

relative thresholds (B,E), and a target voltage (VBAT-Voff3) to define linear portions

401,402. However Apfel does not specify using a target open circuit voltage in defining the

load line.

Since the impedance (slope) of the modified characteristic (402 in Fig. 4) is the same as

the unmodified characteristic 401, the line could be defined by any current/voltage point

(open circuit or loaded) relative to VBAT-Voff1 and still obtain the same characteristic

curve. It would have been obvious to one of ordinary skill in the art at the time of this

application to define the characteristic 402 with any voltage/current relative to the

characteristic 401 as a matter of design choice.

As per **claim 4,** claim rejected for same reasons as claims 2,3. The impedance

(slope) of both curves is equal (Fig. 4).

As per **claim 5,** Apfel (Fig. 1b) discloses the impedance (slope) is 400 ohms

(approximately 320 ohms).

4.   **Claims 6-9,** rejected under 35 U.S.C. 103(a) as being unpatentable over Apfel (5619567)

in view of Ludeman (6665398), and further in view of Zhou (5878133).

As per **claims 6,** Apfel and Ludeman disclose claim 6 for the same reasons as the

rejection of claim 1. However, they do not disclose using programmable registers to hold

the variables that define the characteristic curve.

Zhou teaches a Digital Direct Current Feed control for a SLIC that uses registers to store

values that define a characteristic feed curve (Col 7 lines 10-55). It would have been obvious

to one of ordinary skill in the art at the time of this application to digitally implement as

much of the SLIC circuitry as possible for the advantage of providing a more easily

manufactured product.

As per **claim 7,** Zhou discloses a DSP.

As per **claims 8,9,** claim rejected for same reasons as claim 2-4.

5.   **Claims 10-12,15,** rejected under 35 U.S.C. 103(a) as being unpatentable over Apfel

(5619567) in view of Ludeman (6665398) in view of Zhou (5878133) as applied to claims

6,9,13.

As per **claim 10,** Apfel in view of Ludeman in view of Zhou uses digital registers to store

values used to define a characteristic curve. Apfel uses an open circuit voltage value

(VBAT-Voff1), two relative thresholds (B,E), and a target voltage (VBAT-Voff3). However

they do not specify using a target open circuit voltage in defining the load line.

Since the impedance (slope) of the modified characteristic (402 in Fig. 4) is the same as

the unmodified characteristic 401, the line could be defined by any current/voltage point

(open circuit or loaded) relative to VBAT-Voff1 and still obtain the same characteristic

curve. It would have been obvious to one of ordinary skill in the art at the time of this

application to define the characteristic 402 with any voltage/current relative to the

characteristic 401 as a matter of design choice.

As per **claim 11,** claim rejected for same reasons as claims 10. The impedance

(slope) of both curves is equal (Fig. 4).

As per **claims 12,15,** Apfel (Fig. 1b) discloses the impedance (slope) is 400 ohms

(approximately 320 ohms).

(10) Response to Argument

As per appellant's argument (brief page 6 bottom half to page 7 top half) that Apfel does

not disclose two distinct voltage switching thresholds (only a single current switching threshold),

the examiner disagrees. Apfel discloses point E and point B which are at different voltage

thresholds. The only differences between appellant's Fig. 3 and Apfel's Fig. 4 are the lack of

two distinct current thresholds and the fact that Apfel does not specifically label points E and B

as 'threshold voltages'. Examiner notes that a current through the loop resistance will equal a

metallic loop voltage (V=I*R). Apfel switches between a common current threshold, but the

loop resistance will be different depending on whether the loop is switching from on-hook to off-

hook or it is switching from off-hook to on-hook. As such the loop voltage (voltage threshold)

will be different in each case. This is shown in Apfel's Fig. 4 as points E and B. Examiner

additionally notes that Apfel even contemplates the relationship between the voltage and current

in the loop (Col 3 lines 44-60).

As per appellant's arguments that Ludeman does not teach hysteresis and only teaches

one characteristic curve (brief: page 7 bottom half), the examiner notes that Apfel teaches the

two characteristic curves. Ludeman is relied upon to teach having two distinct current thresholds

(Fig. 6) and provides a valid motivation to implement two distinct current thresholds (as noted in

the original rejection above). Appellant states that the 'transition to' and 'transition from' point

are the same, but that is incorrect. Ludeman Figure 6 shows two distinct transition points at Von

(Ish-) and Voff (Ish+). Ludeman specifically states the advantage of not having the same current

threshold (Col 2 lines 10-23). Examiner additionally notes US patent to Ortel which also

discloses the well known concept of two separate current thresholds in a SLIC (Fig. 16).

As per appellant's arguments that Zhou does not teach hysteresis (brief: page 8),

examiner notes that Zhou is relied on to teach the specifics of implementing a characteristic

curve in a SLIC. Apfel and Ludeman teach the particular characteristic curve.

As per appellant's argument that Apfel and Zhou do not teach two distinct current

thresholds (brief: page 9), examiner notes that Ludeman is relied upon to teach that.

Appellant has repeated his arguments regarding Ludeman (appeal brief page 10).

Examiner offers the same response as noted above. Ludeman does teach two distinct current

thresholds and a valid motivation to implement them.

As per appellant's argument that Ludeman and Apfel appear to teach away from each

other (brief: page 12), examiner contends that the cited motivation in Ludeman to implement two

distinct current thresholds is valid and that one skilled in the art could easily implement the

distinct current thresholds into the curve of Apfel for the advantage state by Ludeman (transition

stability).

As per appellant's argument that the combination is unworkable (brief: page 12),

examiner contends that providing two distinct current thresholds would be obvious to one of skill

in the art. Apfel discloses that a hook switch detector monitors the load current to determine the

offhook condition (APFEL: Col 6 lines 40-45). Apfel discloses that any of a variety of off-hook

detectors known in the art may be used. Apfel could use the off-hook detection disclosed by

Ludeman which provides two distinct current thresholds that define the onhook and offhook

conditions on the loop.

As per appellant's comments on the Ortel reference (brief page 14), the examiner notes

that Ortel is only noted to show the well known concept of two distinct current thresholds in a

SLIC (which is also taught by Ludeman). Examiner contends that the on-hook/off-hook

detection of Ortel could be implemented as one of the 'variety of offhook detectors' that may be

implemented in Apfel. Examiner notes that Apfel does not go into detail as to the specifics of

the hook switch detect (Apfel: Fig. 5 block 533). As such, the examiner contends that this is

even more motivation to look to other prior art systems (to find the specific hook switch detect

implementation).

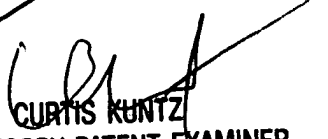**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related

Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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